

AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all prior versions of claims in the application.

1. (Original): A crank angle detector comprising:
 - a rotor rotated in association with a crank shaft of an internal combustion engine and having a plurality of detection portions to be detected at equivalent angle intervals on the outer circumference; and
 - a pickup arranged at the vicinity of the outer circumference of said rotor, for generating a pulse signal when said plurality of detection portions each pass therethrough;
 - wherein one detection portion located immediately before a crank angle corresponding to the upper dead point of a piston of said internal combustion engine, of said plurality of detection portions is set to detect a reference angle of the crank angle.
2. (Original): The crank angle detector according to claim 1, wherein said plurality of detection portions are constructed by projections, respectively, and the one detection portion for detecting said reference angle is set to a length different from the lengths of the other detection portions in the outer circumferential direction of said rotor.
3. (Original): The crank angle detector according to claim 2, wherein the one detection portion for detecting said reference angle is longer than said other detection portions in the outer circumferential direction of said rotor.

4. (Original): The crank angle detector according to claim 1, wherein the respective rear end positions of the plurality of detection portions are located at equivalent angle intervals in the rotating direction of said rotor, and the length from the rear end position to the front end position of the one detection portion for detecting said reference angle is different from the length from the rear end position to the front end position of each of said other detection portions.

5. (Original): The crank angle detector according to claim 4, wherein, when the respective rear end positions of the plurality of detection portions are located at equivalent angle intervals of 15 degrees in the rotating direction of said rotor, the rear end of a detection portion passing through the vicinity of said pickup next to the one detection portion for detecting said reference angle at a rotating time of said rotor is located within a range of zero to ten degrees from the crank angle corresponding to said upper dead point.

6. (Original): An ignition timing controller comprising:
crank angle detecting means rotated in association with a crank shaft of an internal combustion engine, for generating a crank angle pulse signal for each rotation of a predetermined angle, and generating the pulse signal immediately before the crank angle corresponding to the upper dead point of a piston of said internal combustion engine, as a reference pulse signal of an aspect different from that of the other crank angle pulse signal; and
ignition control means for controlling ignition timing of said internal combustion engine in accordance with said crank angle pulse signal;

wherein said ignition control means instructs spark discharge of an ignition plug of said internal combustion engine for the ignition timing in accordance with said crank angle pulse signal generated immediately after said reference pulse signal in a period until said crank shaft is rotated once after cranking of said internal combustion engine is started.

7. (Original): The ignition timing controller according to claim 6, wherein said ignition control means controls electric supply timing to an ignition coil in accordance with said reference pulse signal before the instruction of the spark discharge of said ignition plug in the period until said crank shaft is rotated once after the cranking of said internal combustion engine is started.

8. (Original): The crank angle detector according to claim 6, wherein said crank angle detecting means comprises:

a rotor rotated in association with the crank shaft of said internal combustion engine and having a plurality of detection portions to be detected at equivalent angle intervals on the outer circumference; and

a pickup arranged at the vicinity of the outer circumference of said rotor, for generating said crank angle pulse signal when said plurality of detection portions each pass therethrough;

wherein one detection portion located immediately before the crank angle corresponding to the upper dead point of the piston of said internal combustion engine, of said plurality of detection portions is set to generate said reference pulse signal, and the respective rear end positions of the

plurality of detection portions are located at equivalent angle intervals in the rotating direction of said rotor, and the length from the rear end position to the front end position of the one detection portion for generating said reference pulse signal is different from the length from the rear end position to the front end position of each of said other detection portions.

9. (Original): The ignition timing controller according to claim 6 or 8, wherein said crank angle pulse signal including said reference pulse signal is constructed by a negative pulse and a positive pulse constituting a pair, and said negative pulse is generated correspondingly to the front end of each of said detection portions, and said positive pulse is generated correspondingly to the rear end of each of said detection portions.

10. (Currently Amended): The ignition timing controller according to claim 6 or [[9]]
8, wherein said ignition control means discriminates said reference pulse signal in accordance with the magnitude of a ratio of the generating interval of said negative pulse and the generating interval of said positive pulse.

11. (Currently Amended): The ignition timing controller according to claim 6 or [[9]]
8, wherein said ignition control means instructs an electric supply to said ignition coil when a value provided by dividing the generating interval of said negative pulse by the generating interval of said positive pulse is sufficiently smaller than one in the period until said crank shaft is rotated once after the cranking of said internal combustion engine is started, and then also instructs the

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spark discharge of said ignition plug when the value provided by dividing the generating interval of said negative pulse by the generating interval of said positive pulse is sufficiently greater than one.